

On some species of *Microterys* Thomson, 1876 (Hymenoptera: Encyrtidae) from Africa*

by

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Eight African species of *Microterys* Thomson are dealt with. Two new species, reared from soft scale insects, are described, namely, *M. annekei* and *M. ceroplasiae*. New records and/or redescriptions are given of the following six described species: *capensis* Annecke, *kenyaensis* Compere, *nicholsoni* Compere, *bizanensis* Compere, *flavus* (Howard) and *haroldi* Prinsloo & Rosen. The characters by which this group of species may be distinguished are given, as well as a key to the males and females of all these species.

The encyrtid genus *Microterys* Thomson in Africa includes forms that are closely related to the type-species, *M. sylvius* (Dalman) and other European species. It includes also several forms that, especially in the female, possess certain non-typical characters such as a scutellar flange or lamella, slender antenna with subcylindrical scape, and face with sulcate scrobes. The males of some of these species have the antenna with long setae, a character also not typical of the genus.

This paper deals with new and described African species of *Microterys* considered to be closely related to the type-species, *M. sylvius* (Dalman, 1820). One other species that differs in the female from the other species dealt with here, is also included. This species, *M. haroldi* Prinsloo & Rosen, is set apart from the typical forms of the genus by the fore wing of the female which is strongly and uniformly infuscated from base to near apical margin, the latter narrowly hyaline, and by the weakly developed rim which extends round the posterolateral and posterior margins of the scutellum. Apart from these two characters, *haroldi* fits well the description of the genus given below and I believe that this species is correctly placed in *Microterys* (*vide* Prinsloo & Rosen, 1975).

The generic status of the non-typical forms is at present not certain, and they are therefore not included here. These species are: *umbrinus* Compere and *saissetiae* Compere which share important characters with species of the genus *Trichomasthus* Thomson; and several described and undescribed species similar to *rizicola* Risbec which are closely related and require accommodation in a distinct genus.

The soft scale insect hosts *Saissetia nigra* (Nietner) and *Ceroptlates destructor* Newstead are referred to in this study respectively as *Parasaissetia nigra* (Nietner) and *Gascardia destructor* (newstead), according to the nomenclature of De Lotto (1965).

The holotypes and paratypes of the two new species are in the National Collection of Insects, Plant Protection Research Institute, Pretoria; paratypes of *M. annekei*

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spec. nov. will be housed in the British Museum (Natural History), London, and in the United States National Museum, Washington.

MICROTERYS THOMSON

Microterys Thomson, 1876: 118, 155. Type-species *Encyrtus sylvius* Dalman, 1820
Sceptrophorus Foerster, 1856: 38–39. Type-species *Encyrtus sceptriger* Foerster, 1841 (for synonymy consult Rosen, 1973)
Encyrtus Latreille, 1809 *sensu* Dalman, 1820 *et auctt.*
Syrphophagus Ashmead, 1900 *sensu* Mercet, 1921
Apentelicus Fullaway, 1913: 26. Type-species *Apentelicus kotinskyi* Fullaway, 1913

The African species considered to be closely related to the type-species, *M. sylvius*, may be distinguished by the following combination of characters:

FEMALE. Encyrtids of medium size, about 1.5 mm in length; primary parasitoids of the immature stages and adults of various species of Coccidae. Colour of head and body usually some shade of testaceous, brown or orange; head and dorsum of thorax often with a weak metallic lustre; antennal funicle usually not unicolorous, in which case some of the distal segments are whitish; fore wing infuscated with one or two pale cross-bands beyond the venation (except in *haroldi*), the hind wing entirely hyaline. Head in dorsal view (occiput perpendicular) with occipital margin gently concave, the anterior margin straight or gently convex, often bulging slightly at the eyes, the scrobal emargination not visible; fronto-occipital margin acute; frontovertex narrow to moderately broad, one-fifth to one-third head width measured at median ocellus; ocelli usually in an acute-angled triangle; antennal scrobes shallowly impressed, their lateral margins not sharply angled, broadly confluent dorsally, usually impressed as a semicircle on face in frontal view, as shown in fig. 15; antennal sockets with their upper margins level with or below the basal ocular margins, more than their own length apart at their smallest interval. Antenna with funicle six-segmented, the club three-segmented; scape slightly to strongly expanded ventrally, as much as twice as long as broad, usually in the distal two-thirds or so; pedicel longer or shorter than basal funicle segment; funicle with basal segments longer than wide, the remaining segments subquadrate or wider than long; club about as long as the distal three funicle segments together, rounded at the apex, if broader than the distal funicle segment, then only slightly so; maxillary palpi with four segments, the labial with three; mandibles rather short, more or less stout, with two teeth and some form of truncation. Frontovertex and sometimes face, genae and mesonotum with small punctations; sculpture of head cellulate-reticulate, the cells of the frontovertex rather small; frontovertex with fine, scattered setae which usually arise in the punctations; genae usually more densely setose, the setae becoming longer towards mouth; eyes with sparse, scattered pubescence. Thorax flat or gently convex from side to side and anteroposteriorly in dried specimens (scutellum rather strongly convex in *flavus*); mesoscutum wider than long in cleared slide-mounted specimens, the posterior margin overlapping the mesal union of axillae, the latter separated medially by a narrow sulcus or furrow; scutellum about as long as wide; mesonotum more or less densely setose, with one pair of long suberect setae at the apex of the scutellum; mesonotal sculpture cellulate-reticulate; mesonotum often with fine punctations as on frontovertex. Legs not especially modified. Fore wing 2.5 to three times as long as broad, the cephalic margin of costal cell gently arched; venation variable; stigmal vein usually longer than marginal and postmarginal or these veins subequal in length; basal triangle of wing disc never devoid of setae, evenly and densely setose or at least with one row of setae below the

submarginal vein; wing otherwise evenly and densely setose; speculum not quite complete, separated from the caudal margin of stigmal vein by a few setae; marginal cilia of moderate length, shorter than longest setae on submarginal vein. Gaster variable in length with relation to length of thorax, longer or shorter than the latter; ovipositor, as seen through the derm in cleared slide-mounted specimens, more or less as long as gaster, more than four times as long as gonostyli, the latter slender, more or less acutely pointed at the apices; ovipositor and gonostyli protruding at most moderately caudally.

MALE. The male differs principally from the female in the following characters: head and dorsum of body predominantly blackish-brown to black with strong metallic reflections on the frontovertex, face and mesonotum; antenna usually pale, the funicle unicolorous; fore wing entirely hyaline. Frontovertex wider, approximately one-half head width at median ocellus; ocelli in an obtuse-angled triangle; antennal sockets higher on face, their lower margins about level with basal ocular margins; head in dorsal view (occiput perpendicular) with anterior margin gently concave. Antenna nine segmented; pedicel much shorter than basal funicle segment; all funicle segments plainly longer than wide; funicle with setae short or of moderate length, not longer than longest funicle segment, gently curved; club about as long as the distal two funicle segments together, bluntly pointed at apex. Dorsum of thorax gently to strongly convex from side to side and anteroposteriorly. Abdomen usually more slender than that of female, acutely pointed at the apex.

Key to the African species of *Microterys* closely related to *M. sylvius*

FEMALES

1	Fore wing strongly and uniformly infuscated from base to near apical margin, the latter narrowly hyaline; scutellum with a weakly developed, round rim which extends round the posterolateral and posterior margins	<i>haroldi</i>	
—	Fore wing infuscated with one or two pale cross-bands beyond venation, the distal one rarely interrupted medially; scutellum without a lateral rim		2
2	Fore wing with a single entire pale cross-band beyond venation		3
—	Fore wing with two entire pale cross-bands beyond the venation, or one entire and the second broadly interrupted in the middle		4
3	Head five times as wide as frontovertex; ocelli in an acute-angled triangle, the lateral pair almost contiguous with the orbits; ventral margin of scape edged with black; basal funicle segment longer than pedicel	<i>kenyaensis</i>	
—	Head 3,5 to almost four times as wide as frontovertex; ocelli in an equilateral triangle, the lateral pair more than one-half an ocellar diameter from the orbits; ventral margin of scape not edged with black; basal funicle segment shorter than pedicel	<i>capensis</i>	
4	Fore wing with two entire pale cross-bands beyond venation, the distal one sometimes inconspicuously and narrowly interrupted; frontovertex usually one-third to one-fourth as wide as head (one-sixth in <i>ceroplastae</i>); scutellum flat or only gently convex		5
—	Fore wing with one entire pale cross-band beyond venation, the second broadly and clearly interrupted in the middle; frontovertex about one-fifth as wide as head; scutellum strongly convex	<i>flavus</i>	
5	Frontovertex narrow, about one-sixth head width; ovipositor very long, longer than gaster as seen through the derm in cleared specimens; antennal scape only slightly expanded ventrally, about four times as long as its greatest width; ventral margin of scape not edged with blackish	<i>ceroplastae</i>	
—	Frontovertex one-third to one-fourth as wide as head; ovipositor usually shorter than gaster; antennal scape strongly expanded ventrally, as much as twice as long as wide; ventral margin of scape narrowly or broadly edged with blackish		6
6	Antennal funicle testaceous with some distal segments white	<i>annekei</i>	
—	Antennal funicle uniformly blackish-brown		7

7 Body completely brown to orange-brown with the following parts darker: concealed centre of pronotum, metanotum, gaster and centre of propodeum **nicholsoni**
 — Body dominantly dark reddish-brown or blackish-brown with the following parts testaceous or brown: collar of pronotum and sometimes mesopleura **bizanensis**

MALES

1 Head with frontovertex, upper half of face above antennal sockets and interscrobal prominence blackish-brown, the lower part of face and genae testaceous **ceroplastae** 2
 — Head unicolorous, dark blackish-brown to black
 2 Legs entirely whitish, without darker parts or dark suffusions; scutellum strongly convex **flavus**
 — Legs testaceous with some parts dark or with dark suffusions; scutellum usually not strongly convex
 3 Legs entirely pale testaceous save hind tarsus which is predominantly fuscous 3
 — Middle and hind coxae largely brown to blackish-brown, legs otherwise testaceous or with parts darkened 4
 4 Frontovertex with scattered punctations; antennal sockets with lower margins level with lower orbital margin; funicle with segments II-V subequal in length; funicle segments V-VI with rhinaria **kenyaensis**
 — Frontovertex shagreened but without punctations; antennal sockets with lower margins at a level below lower orbital margin; funicle segments II-III equal in length, longer than IV-V which are equal in length; all funicle segments with rhinaria **capensis**
 5 Antenna with scape blackish; hind leg with tibia suffused with fuscous **haroldi**
 — Antenna with scape yellow or testaceous; hind leg uniformly pale or with femur and tibia partly or entirely fuscous
 6 Body dominantly brown to blackish-brown dorsally; antenna entirely testaceous; legs pale except for hind femur and tibia which are dominantly fuscous **bizanensis**
 — Body very dark blackish-brown to black dorally; antenna with scape pale, flagellum darker; legs pale or with basal half of hind femur and tibia more or less fuscous
 7 Scape yellowish, flagellum testaceous **nicholsoni**
 — Scape testaceous, flagellum dark brown **anneckei** 7

Microterys kenyensis Compere, figs 1-2

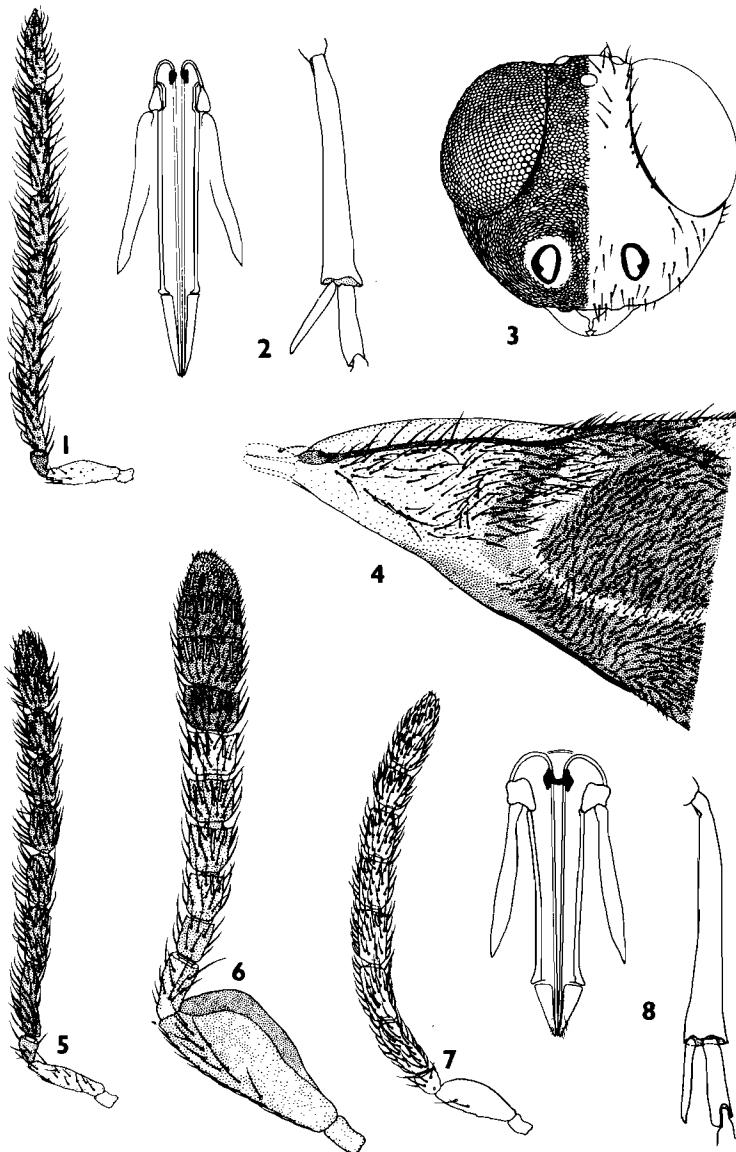
Microterys kenyensis Compere, 1939: 16-17; 1940: 419-420; Annecke, 1963: 173-175; Annecke & Insley, 1971: 19.

This species was described from a single female taken near *Saissetia oleae* on oleanders at Nairobi, Kenya.

The status of the male of *kenyaensis* was hitherto not certain. Compere (1940) described the male (which he thought to be that of *kenyaensis*) from progeny which was produced from two unidentified *Microterys* females collected from black scale at Nairobi in June, 1937, and placed in a cage with black scale. Compere regarded the identification of the male as only tentative, and did not consider the specimens as type material (Compere, 1940).

Some time ago the writer wrote to Dr G. Gordh, Division of Biological Control, University of California, Riverside, requesting the specimens believed by Compere to be the males of this species. No males labelled "*M. kenyensis*" (except one card-point without a specimen) could be found in Compere's collection, although a gelatine capsule containing six males labelled "*Microterys* males" were kindly forwarded. Additional information on this label corresponds exactly with the data given by Compere in his original description of this species (*vide* Compere, 1940: 420). These six males fit the description very well and it can therefore be assumed without hesitation that these males are from the same series as those described by Compere.

At hand is a series of five female and one male on card-points with the accession numbers 1120 and 1121 respectively written on the labels of the females and males in C.



Figs 1-2. *Microterys kenyensis* Compere. 1. Antenna (♂T 4810-3). 2. Ovipositor and middle tibia, drawn to the same scale (♀T 4786-2). Figs 3-4. *M. capensis* Annecke, paratypes. 3. Head, anterior (♀T 412). 4. Basal part of fore wing (♀T 412). 5. Antenna (♂T 412). 6-8. *M. bizenensis* Compere. 6. Antenna (♀T 1670-1). 7. Antenna (♂T 1670-3). 8. Ovipositor and middle tibia drawn to the same scale (♀T 1670-2).

P. Lounsbury's handwriting. The data in Lounsbury's accession book (A.C.C. book) under these numbers show that the material was collected from *Lec(anium) oleae* (now *Saissetia oleae*) by C. W. Mally on March 6, 1900, at Cape Town, South Africa and determined by L. O. Howard as *Microterys* sp. The females have been determined by the writer as *kenyaensis*. No distinguishing characters could be found between the single male and the males from California and it also fits Compere's description very well. It is therefore taken that the males described by Compere are in fact the opposite sex of *kenyaensis*. A redescription of the male is given below.

Also at hand is a single female from *Ceroplastes* sp. on coffee in Kenya and another from *Coccus hesperidum* collected at Stellenbosch, C.P., both determined by D. P. Annecke as *kenyaensis*. These two specimens together with Compere's description of the female were used to determine Lounsbury's series as well as three females from Pilgrim's Rest, Tvl., and two females from Plettenberg Bay, C.P.

The females from Cape Town, which are somewhat faded, and those from Plettenberg Bay differ from the holotype and all the other material mentioned, in that the oral margin is not marked with black and in that the ventral margin of the antennal scape is not nearly so broadly edged with black. The series from Plettenberg Bay may be further distinguished from the other females by the two dark markings on the occiput which are present in the former. These differences in colour marking are not considered to be of specific value.

M. kenyaensis is closely related to *M. capensis* Annecke, but may be distinguished from the female of that species by the width of the frontovertex, size of the ocelli, shape of the antennal funicle, and by the maculation and setation of the fore wing. These characters as well as others given below, serve to separate the two species and to distinguish *kenyaensis* from other related forms: head, thorax and legs predominantly testaceous to orange-brown; abdomen dark basally, testaceous apically, the colours not sharply separated; oral margin usually marked with black; antenna with scape concolorous with head, narrowly or broadly edged with black; pedicel and funicle segments I-IV testaceous, covered with blackish setae; funicle V-VI white, the club black; fore wing with one hyaline cross-band beyond venation, the maculation and setation as figured by Compere (cf. Compere, 1940: 491, fig. 6). Head with frontovertex one-fifth head width at medium ocellus; ocelli in an acute-angled triangle, the lateral pair almost contiguous with the eye margins; antenna (cf. Compere, 1940: 491, fig. 6) with scape strongly expanded ventrally, about 2.5 times as long as its greatest width; funicle segment I longer than pedicel; funicle segments I-V longer than wide, VI quadrate or a little wider than long; ovipositor (fig. 2) about as long as gaster, longer than middle tibia, more than four times as long as gonostyli, the latter slightly longer than middle tibial spur, slender, acute at apex.

MALE. Compere's description of the male, based mainly on colour, is supplemented as follows: head with frontovertex with numerous scattered punctations, clearly visible in cleared slide-mounts and card-pointed specimens; antennal sockets with lower margins level with lower ocular line, more than one-half their own length apart at their smallest internal (about 8:11); scrobes broad, shallowly impressed on face, not confluent dorsally. Antenna (fig. 1) with scape moderately expanded ventrally, about three times as long as its greatest width; funicle with segments long, each plainly longer than wide, subequal in width; funicle I, which is the longest of the funicle segments, about four times as long as pedicel, more than 1.5 times as long as funicle VI which is the shortest of the funicle segments; funicle II-V subequal in length, shorter than I (about

8:11); club somewhat shorter than the distal two funicle segments together, as long as the basal funicle segment; funicle and club densely setose, the setae of moderate length, curved; funicle segments V-VI and club with short rhinaria. Thorax with mesoscutum evenly setose, the scutellum less densely so; mesoscutum cellulate-reticulate, the sculptural cells not particularly large, appearing slightly raised in cleared slide-mounts. Middle leg with tibial spur slightly shorter than basal tarsal segment. Fore wing with post-marginal vein as long as or a little longer than marginal, as long as stigmal; wing disc almost devoid of setae from base to a level about halfway along submarginal vein; remainder of disc finely setose; hind wing finely setose from near base to apex. Abdomen shorter than thorax in cleared slide-mounted specimens, the gaster more or less heart-shaped.

MATERIAL EXAMINED. 12♀ and 7♂ with the following collection data: KENYA: 18.x.1938, ex *Ceroplastes* sp. on coffee, 1♀, det. D. P. Annecke (material received from Department of Agriculture, Rydalmere, N.S.W., Australia); Nairobi, "propagated by Flanders from ♀ coll. Compere, Nairobi, June 1937, ♀ ex *S. oleae* on oleander", 6♂ (T 4810); SOUTH AFRICA: Cape Town, 6.iii.1900, C. W. Mally, ex *Lec(anium) oleae*, 5♀, 1♂ (T 4811); Stellenbosch, C.P., vii.1961, J. H. Giliomee, ex *Coccus hesperidum*, 1♀, det. D. P. Annecke; Plettenberg Bay, C.P., xi.1972, G. L. Prinsloo, ex *Siassetia* sp. on *Salvia africana-lutea* L., 2♀ (T 4583); Pilgrim's Rest, Tvl., v.1973, H. P. Insley, ex *Ceroplastes* sp. on *Anthospermum aethiopicum* L., 3♀ (T 4786).

Note: Material in this study referred to as "received from Department of Agriculture, Rydalmere, New South Wales" was material from Kenya retained for reference purposes at Rydalmere after part of it was sent to H. Compere in California for identification.

Microterys capensis Annecke figs 3-5

Microterys capensis Annecke, 1963: 171, 173-175; Annecke & Insley, 1971: 18.

This species is known only from the type series which was collected with *Pulvinaria* sp. on *Cotyledon orbiculata* at Hout Bay, C.P. The female holotype, allotype and seven paratypes have been examined. One female and one male paratype on card-points have been cleared in caustic soda and remounted on slides.

This species is similar to *kenyaensis* in both sexes, but differs in most of the characters mentioned for that species. Annecke (1963) gave a comparative description of the female of *capensis*.

The following characters serve to separate the female of this species from that of *kenyaensis*: head testaceous to pale brown; antenna as in *kenyaensis* except for the ventral margin of scape which is not edged with black; abdomen dark brown to almost black dorsally; head (fig. 3) 3.5 to almost four times as wide as frontovertex at medium ocellus; lateral ocelli more than one-half an ocellar diameter from the orbits. Antenna (cf. Annecke, 1963: 171) with all funicle segments shorter than pedicel, I-III longer than wide, IV subquadrate, V-VI wider than long; fore wing with maculation and setation of basal triangle as shown in fig. 4.

Apart from Annecke's (1963) statement that the male of this species agrees with Compere's description of the male of *kenyaensis*, no further description was given. The males of the two species are in fact similar in colour and also in most of the structural characters, but *capensis* may be readily distinguished from *kenyaensis* as follows:

head with frontovertex shagreened but without punctations; antennal sockets with lower margins at a level below the lower ocular line, about their own length apart at their smallest interval. Antenna (fig. 5) with funicle segments II-III equal in length, longer than IV-V which are equal in length; club almost as long as the distal two funicle segments together; all funicle and club segments with rhinaria; basal triangle of fore wing with two rows of setae below submarginal vein and one row near caudal wing margin.

MATERIAL EXAMINED. ♀-Holotype, allotype, 6♀ and 1♂ paratypes (T 412) with the following collection data: SOUTH AFRICA: Hout Bay, C.P., x.1956, H. K. Munro, with *Pulvinaria* sp. on *Cotyledon orbiculata* L.

Microterys bizeanensis Compere figs 6-8

Microterys bizeanensis Compere, 1939: 16, 18-20; Annecke, 1963: 174-175; Annecke & Insley, 1971: 18.

This species was described from 14 females and 6 males reared from *Saissetia cuneiformis* (now *Parasaissetia nigra*) on *Schinus molle* and *Olea chrysophylla* (now *O. africana*) collected at two different localities in Eritrea, North-East Africa.

The writer has received on loan from the British Museum (Natural History), London, one female paratype and two other specimens. The latter, a male and female, are from one of the type localities and were determined as *bizeanensis* by G. J. Kerrich. All the specimens are on card-points. This material was used as a basis for identifying a series of four females and three males from Ethiopia.

Slight colour differences occur between the specimens at hand. The female determined by Kerrich differs from the paratype and the four females from Ethiopia in that the clypeal margin is broadly suffused with blackish-brown. In the Eritrean male, the antennal flagellum, dorsum of thorax and hind tibia and femur are somewhat darker than in the card-pointed male from Ethiopia. These slight differences in colour are not considered to be of specific value.

The male and female of *bizeanensis* may be clearly separated from other related species by the colour, as given in the original description and as noted in the foregoing key. The description of the structural characters given below serve to supplement that given by Compere (1939). These additional characters were drawn up from the cleared slide mounted specimens of the series from Ethiopia.

FEMALE. Head with scrobes broadly confluent dorsally, forming a characteristic semicircular impression on face in frontal view, the interscrobal area not prominent; antennal sockets with upper margins at a level only slightly below the lower orbital margin, more than their own length from the clypeal margin. Antenna (fig. 6) with scape strongly expanded ventrally, about twice as long as its greatest width; all funicle segments about equal in length, increasing progressively in width towards the club, I-II longer than wide, III quadrate, IV-V slightly wider than long, VI plainly wider than long; Compere described the funicle with segments increasing slightly in width distally, the first slightly longer than wide and the sixth slightly wider than long, but his illustration (cf. Compere 1939: 19, fig. 5) as well as the paratype at hand, correspond well with fig. 6 and the present description.

Thorax with mesoscutum and scutellum fairly densely setose, the apical area of the latter devoid of setae except for a pair at the apex (cf. Compere 1939: 19, fig. 5). Fore

wing (*cf.* Compere 1939: 19, fig. 5) with two entire pale cross-bands beyond venation, about 2.5 times as long as broad; wing disc with basal triangle devoid of setae except for a single row below the submarginal vein; fore wing otherwise densely setose, the setae beyond venation shorter and finer, those confined to the hyaline bands extremely short and fine; marginal, stigmal and postmarginal veins about equal in length; hind wing with a cross-band of extremely fine setae just beyond the apex of venation. Middle tibial spur a trifle shorter than basal tarsal segment of middle leg. Abdomen with ovipositor (fig. 8), protruding moderately caudally, variable in length with relation to gaster in the two slide-mounted specimens: as long as gaster or a little shorter than gaster (about 10:13); ovipositor about 5.5 times as long as gonostyli, a little longer than middle tibia; gonostyli somewhat shorter than middle tibial spur.

MALE. Head 2.5 times as wide as frontovertex at medium ocellus; ocelli in an obtuse-angled triangle, the lateral pair about three times an ocellar diameter apart, about one-half an ocellar diameter from the orbits; antennal sockets with lower margins at a level below basal ocular line, slightly more than their own length apart at their smallest interval. Antenna (fig. 7) with scape expanded ventrally, about 2.5 times as long as its greatest width, more or less than five times as long pedicel; funicle segments all plainly longer than wide, subequal in width, gradually decreasing in length towards the club; club about as long as the distal two funicle segments together; funicle segments II-VI and club with rhinaria; antennal setation as in fig. 7. Frontovertex with characteristic punctations. Thorax and appendages similar to that of female, the wings entirely hyaline.

MATERIAL EXAMINED. 6♀ and 4♂ with the following collection data: ERITREA: Nefasit, iv.1930, H. Compere, ex *Parasaissetia nigra* on *Schinus molle* L. and *Olea africana* Mill., 1♀ paratype; Asmara, iii.1949, G. De Lotto, ex *Ceronema* sp., "COM. INST. ENT. COLL. NO. 11314", 1♀, 1♂, det. G. J. Kerrich, 1950; ETHIOPIA: Alemaya, ii.1964, B. G. Hill, ex *Parasaissetia nigra* on *Pyrus malus* L., 4♀, 3♂ (T 1670).

Microterys nicholsoni Compere

Microterys nicholsoni Compere, 1939: 16-18; Annecke, 1963: 174-175; 1964: 4-5, 13, 57; Annecke & Insley, 1971: 19.

This species was originally described from eight females and eight males collected by E. W. Rust at Durban, Natal, 1925, and reared from three different hosts: *Saissetia oleae*, *S. perseae* (prob. *Parasaissetia nigra*), and *Coccus hesperidum*. *M. nicholsoni* has never again been recorded from *C. hesperidum*, and it is possible that Rust's record of this host was an error. Annecke (1964) illustrated this species in detail.

The type series of this species has not been seen. Six series of males and females from South Africa and one from Kenya, all determined by D. P. Annecke as *M. nicholsoni*, have been examined and compared with several other series which accumulated in the National Collection of Insects, Pretoria, over the past few years.

M. nicholsoni resembles *M. annekei* spec. nov. closely, but it may be readily separated from that species in the female by the narrower frontovertex as well as by the shape and colour of the antenna. According to the original description, the female types have the antennal funicle dark except for segment V which is white. In almost all the series examined by the writer some females also have the fourth funicle segment whitish.

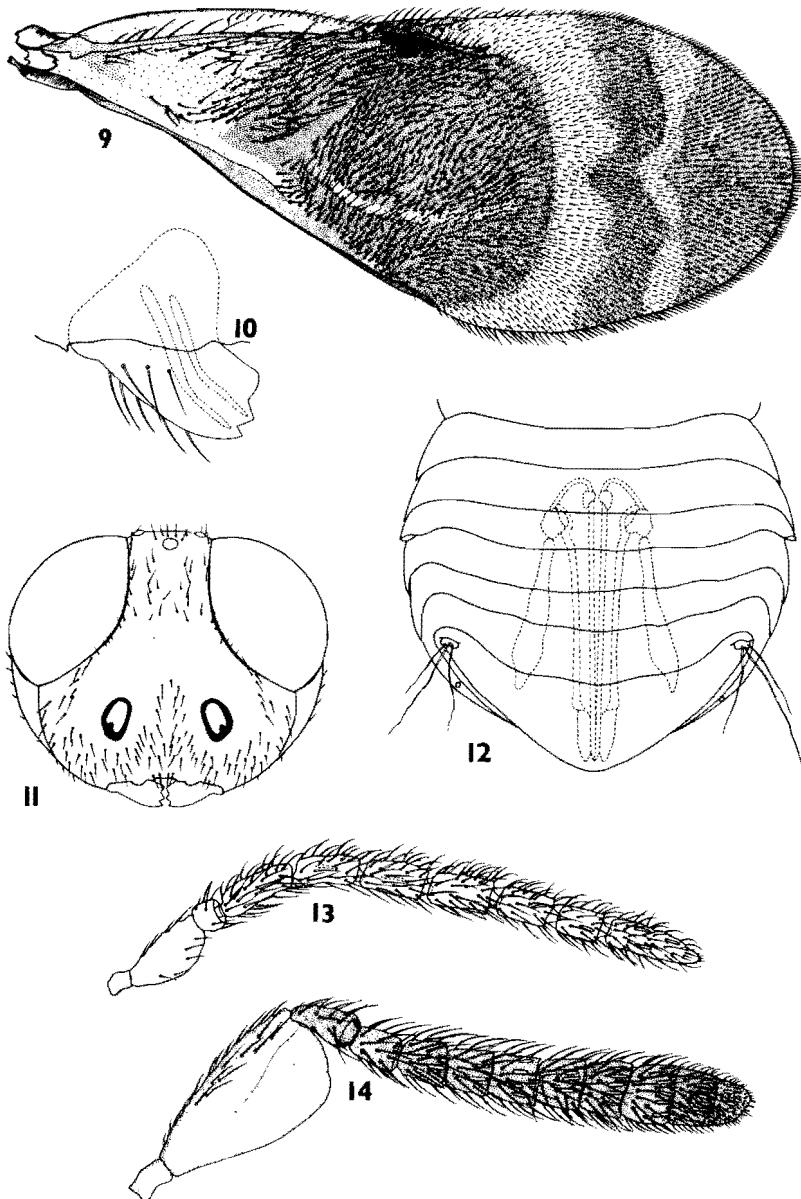
The male of this species is almost identical to that of *annekei*, and apart from slight differences in the coloration of the antenna (as indicated in the key), no other characters of specific significance could be found that separate the males of these two species. According to Compere's description of the types, the legs of the male of *nicholsoni* are testaceous except for the middle and hind coxae and distal one-half of the hind tibia which are fuscous. In the 58 males examined by the writer the hind leg (except for the fuscous coxa) is entirely pale testaceous or with basal one-half or so of femur and tibia more or less fuscous. Precisely this variation is present also in the males of *annekei*.

MATERIAL EXAMINED. 108♀ and 58♂ with the following data: KENYA: Nairobi, xi.1960, K. K. Shavrak, ex *Parasaissetia nigra* on grenadilla, 13♀, 7♂ (T 383); SOUTH AFRICA: Pietersburg, Tvl., v.1961, D. des S. Thomas, ex *Parasaissetia nigra* on grenadilla, 8♀, 6♂ (T 857); Pretoria, Tvl., vii-xii.1956, D. P. Annecke, ex *Parasaissetia nigra* on grenadilla, 3♀, 1♂; Pretoria, viii.1961, D. P. Annecke, ex *Parasaissetia nigra* on *Cussonia paniculata* Eckl. & Zeyh., 1♀; Pietersburg, v.1966, G. J. Snowball, ex *Parasaissetia nigra* on *Maytenus senegalensis* (Lam.) Exell., 14♀, 2♂; Pretoria, E. C. G. Bedford, ex *Gascardia destructor*, on *Eugenia australis* and *Gymnosporia buxifolia* [now *Maytenus heterophylla* (Eck. & Zeyh.) Robson] 4♀, 4♂ (AcPL 637,638); v.1955, ex *Saissetia* sp., on grenadilla, 3♀, 3♂ (AcPL 582,583); all the preceding material determined by D. P. Annecke; Tzaneen, Tvl., xi.1964, C. J. Cilliers, ex soft scale on *Syzygium cordatum* Hochst., 2♀, 1♂ (T 1930); Clanwilliam, C.P., xii.1971, C. E. Kennett, ex *Saissetia* sp., on *Ficus* sp., 4♀, 1♂ (T 4138); 3♀ (T 4046); Oribi Gorge, Natal, i.1972, H. P. Insley, ex *Parasaissetia nigra* on *Ficus petersii* Warb., 38♀, 15♂ (T 4139); Elandskraal, Tvl., x.1972, H. P. Insley, ex soft scale, on *Cussonia spicata* Thunb., 2♀, 1♂ (T 4446); Pietersburg, v.1971, D. P. Annecke, ex *Gascardia destructor* on *Maytenus* sp., 1♀ (T 3838); Stellenbosch, C.P., x.1971, H. P. Insley, ex *Saissetia* sp. on *Ficus* sp., 1♀ (T 4806); RHODESIA: Salisbury, iii.1972, A. Watsham, ex *Saissetia somereni* on *Abutilon* sp., 9♀ (T 4805).

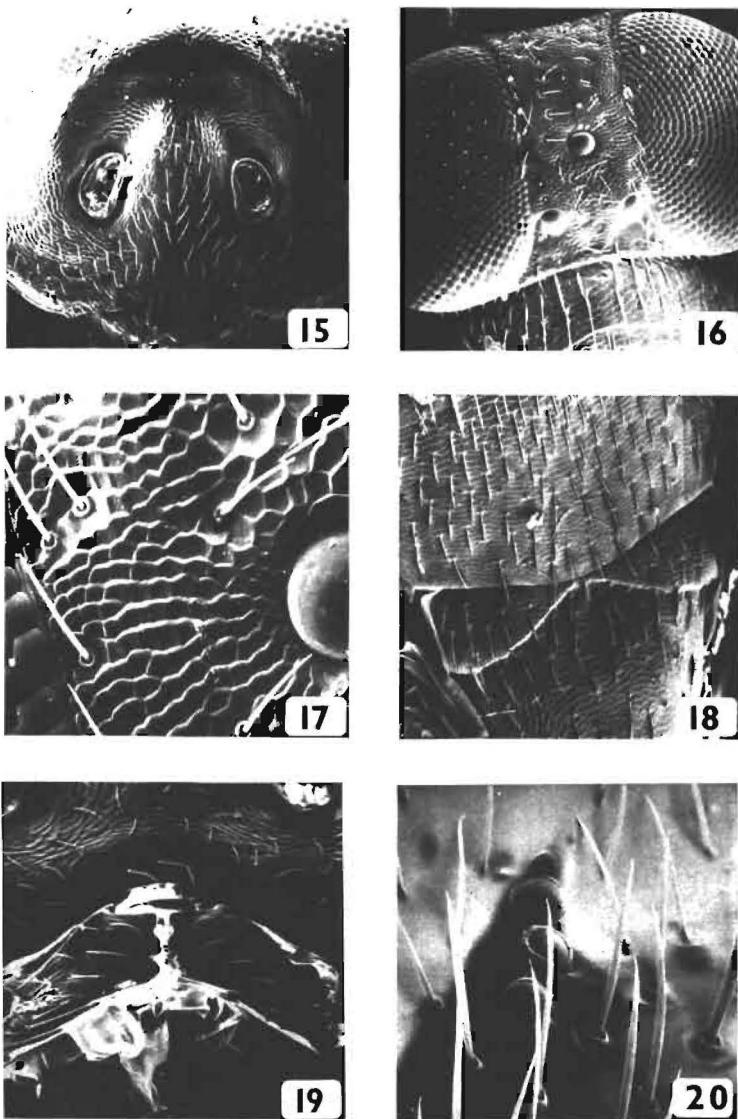
Microterys annekei spec. nov., figs 9-22

The female of this new species may be easily distinguished from related forms with two pale cross-bands on the fore wing, by the strongly expanded antennal scape and the blackish-brown funicle without any white segments. The male of this species is very much like that of *nicholsoni*, and differs from it only in the colour of the antenna. The structural characters of the female were drawn up from 48 cleared slide-mounted specimens.

FEMALE. Length: about 1.5-2.0 mm. Colour: head orange-brown; tips of mandibles blackish-brown; antenna with scape almost concolorous with head, slightly paler, the ventral margin edged with blackish-brown; pedicel and funicle blackish-brown, the club almost black, fading slightly apically; thorax orange-brown, with faint purple reflections on the dorsum in certain plays of light, the setae brownish; metanotum blackish-brown in some specimens; dorsum of gaster brown to blackish-brown, the margin edged with testaceous; legs almost concolorous with head, the dark setae lending a brownish appearance; tarsal tips blackish-brown; fore wing strongly infuscated with two entire pale cross-bands beyond the venation as shown in fig. 9; hind wing entirely hyaline. Head (figs 11, 16) more or less than four times as wide as frontovertex at median ocellus (1:3.3-4.4; mean 1:3.8); in a few small specimens the frontovertex is relatively broader (1:3.3), but in most specimens the frontovertex is about one-fourth

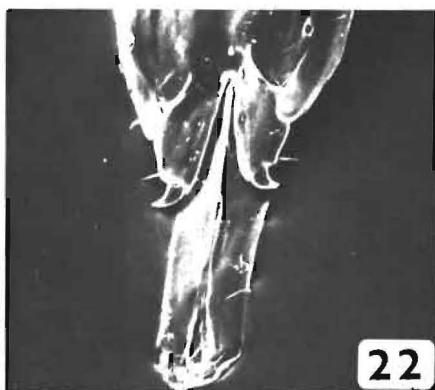
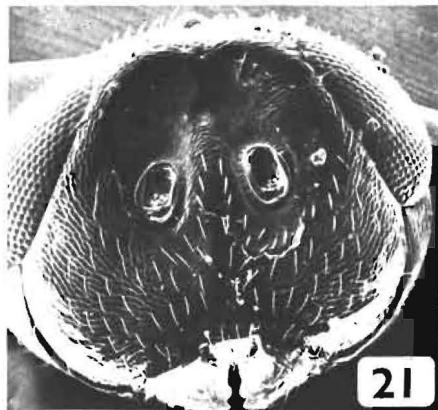


Figs 9-14. *Microterys annekei* spec. nov., paratypes. 9. Fore wing (♀T 4019-2). 10. Right mandible (♀T 4761-3). 11. Head, anterior (♀T 4761-8). 12. Gaster, dorsal, with ovipositor as seen through the derm (♀T 4019-2). 13. Antenna (♂T 2844-5). 14. Antenna (♀T 2844-1).



Figs 15-20. Scanning electron photomicrographs of *Microterys annekei* spec. nov. 15. Head, ♀. anterior, antennae removed, showing semicircular impression of scrobes on face, X210. 16. Head, ♀, dorsal, showing punctations on frontovertex, X525. 17. Head, ♀, dorsal, showing sculpture of frontovertex between median ocellus and eye margin, X1100. 18. Thorax, ♀, dorsal, showing sculpture and setation of mesonotum, X215. 19. Head, ♀, anteroventral, showing mandibles, X525. 20. Disc of fore wing, ♀, showing apex of stigmal vein with four sensilla and discal setae, X2100.

head with as indicated by the mean value; ocelli in an acute-angled triangle, the lateral pair separated from each other by more than twice (1:2,2-4,1; mean 1:2,8) and from the eye margins by about one-half their own diameter; scrobes characteristic of the genus, as shown in fig. 15; interserosal prominence gently convex; antennal sockets with upper margins slightly below the lower margin of eyes, 1,5-2,0 (mean 1:1,8) times their own length apart at their smallest interval, about their own length from the clypeal margin; mandible as in figs 10, 19. Antenna (fig. 14) with scape strongly expanded ventrally in the distal two-thirds or so, about twice as long as its greatest width; pedicel more or less than 1,5 times as long as basal funicle segment; all funicle segments about equal in length, increasing gradually in width towards club, VI almost twice as wide as I; funicle I plainly longer than wide, II less so, III about as wide as long, V and VI plainly wider than long; club about as long as the preceding three funicle segments together, the basal club segment about as wide as distal funicle segment; all funicle and club segments with rhinaria, those on the basal funicle segment not visible in some specimens; antennal



Figs 21-22. Scanning electron photomicrographs of *Microterys annekei* spec. nov. 21. Head, ♂, anterior, antennae removed, X200. 22. Male genitalia, showing aedeagus and digitus volsellari with hooklets, X1000.

setation as in fig. 14. Head with setation on face and genae as in fig. 11; frontovertex with long fine setae arising in small punctations as shown in fig. 16; integument of head cellulate-reticulate, the cells clearly raised under high magnification as shown in fig. 17.

Thorax with mesoscutum plainly wider than long in cleared slide mounts, the posterior margin slightly overlapping the mesal union of axillae; scutellum only a trifle longer than wide; mesonotum only gently convex anteroposteriorly and from side to side in dried specimens; mesonotum (fig. 18) evenly and rather densely setose, the setae becoming longer towards apex of scutellum, one pair at apex extremely long; mesonotal sculpture as in fig. 18. Middle leg with tibial spur as long as or a trifle shorter than basal tarsal segment.

Fore wing (fig. 9) about 2,5 times as long as wide; marginal vein a little longer than postmarginal, the latter reaching to a level about halfway along stigmal vein; apex of stigmal vein with four sensilla and discal setae of wing under high magnification as shown in fig. 20; setation of wing disc otherwise as in fig. 9; hind wing with base devoid of setae, otherwise densely and finely setose.

Gaster (fig. 12) heart shaped in cleared slide-mounts, a little shorter than thorax; ovipositor as long as or a little shorter than gaster in cleared specimens, more or less than five times as long as gonostyli (1:4.6-5.7; mean 1:5.2), the latter about two-thirds as long as middle tibial spur (1:1.4-1.9; mean 1:1.5); ovipositor and gonostyli not or only slightly exserted caudally; ovipositor variable in length in relation to length of middle tibia; usually slightly longer than middle tibia (1.2:1.0); as long as middle tibia or slightly shorter.

MALE. Colour: head with frontovertex and face black, shiny, with very strong metallic green and faint purple or bronze reflections; oral region testaceous to brown, the mandibular tips blackish-brown; dorsum of thorax (save tegulae which are testaceous) and abdomen almost black, with bronze, purple or greenish reflections on the mesonotum, the lateroventral parts more brownish; antenna with scape sordid white to testaceous, the flagellum dark brown to blackish-brown; fore leg sordid white to testaceous; middle and hind legs with coxae predominantly brown to blackish-brown, otherwise concolorous with fore leg, the hind tibia and basal two-thirds or so of hind femur much darker in some specimens; wings entirely hyaline.

Head (fig. 21) with frontovertex about one-half head width at medium ocellus; scrobes not particularly long, broad, shallowly impressed, their lateral margins rounded, converging but not confluent dorsally, as shown in fig. 21; antennal sockets with their lower margins at a level slightly above lower eye margins, about their own length apart. Antenna (fig. 13) with scape expanded ventrally, 2.0-2.5 times as long as its greatest width; funicle with basal segment longer than or rarely shorter than each of the following three segments which are about equal in length; funicle V a little shorter than IV and slightly longer than VI which is the shortest of the funicle segments; club about as long as the distal two funicle segments together; antennal setation as in fig. 13; club and all funicle segments or at least II-VI with rhinaria. Head with sculpture and setation of face as shown in fig. 21.

Thorax structurally similar to that of female. Middle leg with basal tarsal segment about as long as middle tibial spur. Fore wing a little more than twice as long as broad; post marginal vein slightly longer than marginal, reaching to a level near apex of stigmal vein; disc of fore wing evenly and densely setose from near base to apex. Abdomen with gaster about as long as thorax in cleared slide-mounts, bluntly pointed at the apex; male genitalia with aedeagus, digitus volsellari and hooklets as in fig. 22.

MATERIAL EXAMINED. ♀-Holotype, 75♀ and 55♂ paratypes with the following collection data: SOUTH AFRICA. Hogsback, C.P., x.1968, D. P. Annecke, ex *Saissetia* sp. on *Xymalos monospora* (Harv.) Baill., ♀-holotype, 7♀, 17♂ (T 2844); Gansbaai, C.P., x.1971, H. P. Insley, ex *Parasaissetia litorea* on *Sideroxylon inerme* L. 23♀, 11♂ (T 4019); ex *Pulvinaria mesembryanthemi* on *Rhus lucida* L., 14♀, 7♂ (T 4093); Bredasdorp, C.P., H. P. Insley, ex *Filippia* sp. on *Sideroxylon inerme*, 4♀, 3♂ (T 4027); Plettenberg Bay, C.P., xi.1972, G. L. Prinsloo, ex *Parasaissetia litorea* on *Passerina* sp., 27♀, 17♂ (T 4761).

This species is named for Dr D. P. Annecke, Plant Protection Research Institute, Pretoria, who collected the first series of this new encyrtid.

Microterys ceroplastae spec. nov. figs 23-29

The narrow frontovertex, antennal scape which is only slightly expanded and the extremely long ovipositor are the main diagnostic characters that distinguish the

female of this new species from that of *M. nicholsoni* Compere, its closest relative. The bicolorous head of the male of *ceroplastae* is a distinctive character. This new species is known only from the type locality in Kenya.

FEMALE. Length: about 2,25 mm. Colour: The two card-pointed specimens are dominantly yellowish-orange to brownish-orange except for the following parts: antenna with funicle segments I-IV brownish, V-VI sordid white, the club blackish-brown; metanotum and areas of gaster round cercal plates blackish-brown; tips of tarsi dark. Fore wing infuscated with two hyaline cross-bands beyond venation as shown in fig. 23; hind wing entirely hyaline.

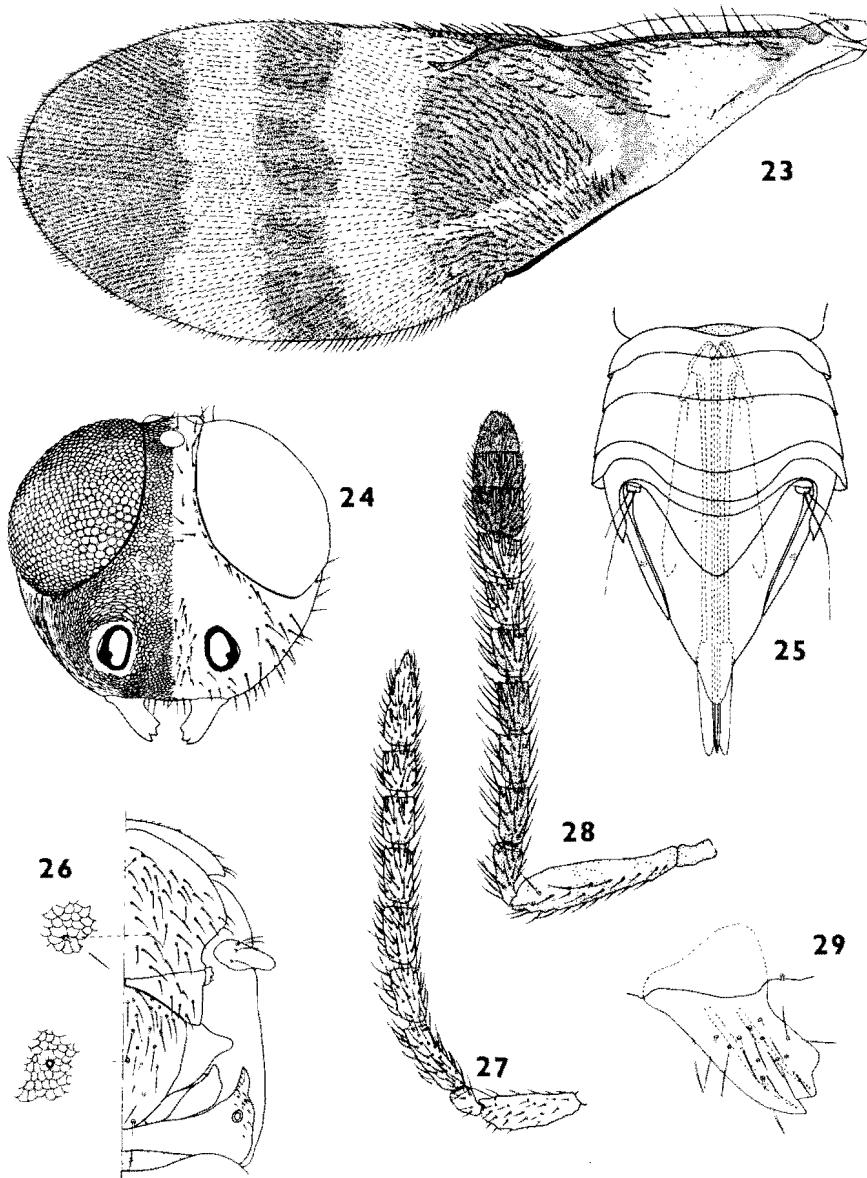
Head (fig. 24) with frontovertex narrow, about one-sixth as wide as head at medium ocellus; ocelli in a strongly acute-angled triangle, large, the lateral pair almost contiguous with the eye margins, less than an ocellar diameter apart; scrobes shallowly impressed on face, converging slightly, the interscrobal prominence gently convex; antennal sockets with upper margins at a level clearly below lower eye margins, almost twice their own length apart at their smallest interval, one-half their own length from the clypeal margin; mandible as in fig. 29. Antenna (fig. 28) with scape only slightly expanded ventrally in the distal three-fourths, four times as long as its greatest width; pedicel small, about one-fourth as long as scape, a trifle shorter than the basal funicle segment; funicle segments I-V each longer than wide, decreasing in length and increasing in width towards the club, V subquadrate; funicle VI quadrate; club not quite as long as the distal three funicle segments together, only slightly wider than the distal funicle segment; funicle and club densely setose, the setae gently curved; all funicle and club segments densely setose, the setae gently curved; all funicle and club segments with rhinaria. Frontovertex with fine, long scattered setae arising in small punctations, the genae rather densely setose, the integument of frontovertex cellulate-reticulate, the sculptural cells small, as shown in fig. 24.

Thorax (fig. 26) with mesonotum slightly convex in dried specimens, the mesoscutum semi-transparent; mesoscutum a little less than 1,5 times as wide as long in the cleared slide-mounted specimen, the posterior margin overlapping the mesal union of axillae; scutellum longer than wide (about 11:9); mesoscutum evenly setose, the scutellum much more sparsely so, the setae longer than those of mesoscutum, the suberect pair at apex extremely long; mesonotal sculpture as in fig. 26. Middle leg with tibial spur as long as basal tarsal segment.

Fore wing (fig. 23) long and rather narrow, almost three times as long as wide; post marginal vein long, almost as long as marginal, reaching to a level nearly at apex of stigmal; discal setation as in fig. 23; hind wing densely and finely setose from near base to apex.

Abdomen with gaster (fig. 25) long and slender, longer than thorax in the cleared specimen, acutely pointed at apex; ovipositor (fig. 25) long and slender, longer than gaster, about four times as long as gonostyli, a trifle more than 1,5 times as long as middle tibia; gonostyli slender, rounded apically, longer than middle tibial spur (8:7) ovipositor and gonostyli protruding caudally as shown in fig. 25.

MALE. Colour: head with frontovertex, upper half of face above antennal sockets and interscrobal prominence brown to blackish-brown, shiny, with strong bronze and fainter greenish reflections; face below antennal sockets and genae testaceous; upper and lower half of occiput respectively concolorous with frontovertex and genae; antenna with



Figs 23-29. *Microterys ceroplastae* spec. nov., paratypes. 23. Fore wing (♀T 3157). 24. Head, anterior (♀T 3157). 25. Gaster with ovipositor as seen through the derm, dorsal (♀T 3157). 26. Thorax, dorsal, with sculpture of mesoscutum and scutellum enlarged (♀T 3157). 27. Antenna (♂T 4824). 28. Antenna (♀T 3157). 29. Mandible (♀T 3157).

scape testaceous, the flagellum more brownish, the pedicel somewhat darker than funicle and club; thorax with dorsum and lateroventral parts respectively concolorous with frontovertex and genae; legs pale testaceous; abdomen almost black, shiny; wings hyaline.

Head 2.5 times as wide as frontovertex at medium ocellus; ocelli large, almost in an equilateral triangle, the lateral pair separated from each other by twice, and from the eye margins by one-half, an ocellar diameter; antennal sockets with lower margins at a level slightly below the lower eye margins; scrobes moderately deep, converging, almost confluent dorsally, the interscrobal prominence rather strongly convex. Antenna (fig. 27) with scape approximately 3.5 times as long as its greatest width; pedicel small, a little longer than wide, less than one-half as long as basal funicle segment; funicle segment I longer than each of the following three segments (7:5) which are about equal in length; funicle V a little shorter than the preceding segment, a little longer than VI which is the shortest of the funicle segments; club as long as the distal two funicle segments together; antennal setation as shown in fig. 27; funicle segments IV-VI and club with rhinaria. Frontovertex with punctations as in female.

Thorax similar to that of female, the mesonotum finely and evenly setose. Fore wing broader than that of female, a little more than twice as long as wide (about 16:7); post marginal vein long, slightly longer than marginal, extending almost or fully to a level of apex of stigmal; fore and hind wings evenly and densely setose from near base to apex. Abdomen with gaster long, triangularly shaped, the apex acutely pointed.

MATERIAL EXAMINED. ♀-Holotype, 2♀ and 3♂ paratypes with the following collection data: KENYA: 3.xi.1936, ex *Ceroplastes* sp. on coffee, 2♀, 1♂ (T 3157); xii.1935, 2♂ (T 4824); Limuru, 8.x.1935, ex *Gascardia destructor* on coffee, ♀-holotype (T 4907). All material received from Department of Agriculture, Rydalmer, New South Wales.

Microterys flavus (Howard)

Encyrtus flavus Howard, 1881: 367

Microterys flavus (Howard): Ashmead, 1900: 391; Peck, 1963: 387-388; Annecke, 1963: 174-175; 1964: 4-5, 13-14; Annecke & Insley, 1971: 19; Trjapitzin & Sugonjaev, 1972: 615-617.

This well-known economically important species is a parasitoid of various soft scale insects and is distributed through the world. In southern Africa it commonly attacks *Coccus hesperidum* on Citrus.

The possible synonymy of *flavus* with two other species of the genus needs mentioning. Trjapitzin & Sugonjaev (1972) noted the probable synonymy of *M. flavus* (Howard, 1881) with *M. nietneri* (Motschulsky, 1859). In an accompanying key dealing with some forms related to *flavus*, these two species are grouped together in the same couplet. The writer has not seen the types of *nietneri* which are, unfortunately, not available for study. *M. flavus* also appears to be a senior synonym of *M. frontatus* (Mercet, 1921) (*vide* Trjapitzin, 1969). Rosen intended to publish the synonymy (Rosen *in litt.*, 1973) but has not yet done so. Both *flavus* and *frontatus* would have to fall as junior synonyms of *nietneri* if the synonymy of *flavus* and *nietneri* is confirmed.

Peck (1963) provides a comprehensive list of literature dealing with the taxonomy, biology and distribution of this species which needs no further attention here. Annecke (1964) illustrated the male and female in detail and both sexes may be readily distinguished from the related African species of *Microterys* as noted in the foregoing key.

Several series of this species from southern Africa, California, Pakistan and Australia are housed in the National collection of Insects, Pretoria.

Microterys haroldi Prinsloo & Rosen

Microterys fuscipennis Compere, 1928: 217-8; 228-231.
Microterys haroldi Prinsloo & Rosen, 1975: 85-87.

This species was originally described by Compere (1928) as *M. fuscipennis*, but because that name was preoccupied by *M. fuscipennis* (Dalman), Prinsloo & Rosen (1975) proposed the new name *M. haroldi*, for it.

Little need be said about this species here. The female may be easily separated from those of related species by the maculation of the fore wing as noted in the foregoing key. Additional characters, illustrations, notes on related forms and new records are given by Prinsloo & Rosen (1975).

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The writer wishes, finally, to record his appreciation to the staff of the Department of Zoology, University of Potchefstroom for C.H.E., for authorizing the use of their departmental Stereoscan electron microscope and for taking a series of photographs.

REFERENCES

ANNECKE, D. P. 1962. Records and descriptions of African Encyrtidae—I (Hymenoptera: Chalcidoidea). *J. ent. Soc. Sth. Afr.* **25** (2): 170-191.
 ——— 1964. The encyrtid and aphelinid parasites (Hymenoptera: Chalcidoidea) of Soft Brown Scale, *Coccus hesperidum* Linnaeus (Hemiptera: Coccoidea) in South Africa. *Entomology Mem. Dep. agric. tech. Serv. Repub. S.Afr.* **7**: 1-74.
 ANNECKE, D. P. & INSLEY, H. PATRICIA, 1971. Catalogue of Ethiopian Encyrtidae and Aphelinidae (Hymenoptera: Chalcidoidea). *Entomology Mem. Dep. agric. tech. Serv. Repub. S.Afr.* **23**: 1-53.
 ASHMEAD, W. H. 1900. On the genera of chalcid-flies belonging to the subfamily Encyrtinae. *Proc. U.S. natn. Mus.* **22**: 323-412.
 COMPERE, H. 1928. New coccid-inhabiting chalcidoid parasites from Africa and California. *Univ. Calif. Public Ent.* **4** (8): 209-230.
 ——— 1939. A second report on some miscellaneous African Encyrtidae in the British Museum. *Bull. ent. Res.* **30** (1): 1-26.
 ——— 1940. Parasites of the Black Scale, *Saissetia oleae*, in Africa. *Hilgardia* **13** (7): 387-425.

DE LOTTO, G. 1965. On some Coccidae (Homoptera), chiefly from Africa. *Bull. Br. Mus. (nat. Hist.) Ent.* **16**: 177-239.

FOERSTER, A. 1856. Hymenopterologische Studien. Heft 2, Chalcididae und Proctotrupii: 1-152.

FULLAWAY, D. T. 1913. Report of the Entomologist. *Hawaii agric. Exp. Sta* (for 1912): 25-31.

HOWARD, L. O. 1881. Report on the parasites of Coccidae in the collection of this department. *Rep. U.S. Dep. Agric.* (for 1880): 350-372.

MERCET, R. G. 1921. Himenópteros Fam. Encyrtidos. *Fauna iber.* pp. i-xi & 1-732.

PECK, O. 1963. A catalogue of the nearctic Chalcidoidea (Insecta: Hymenoptera). *Can. Ent. Suppl.* **30**: 1-1092.

PRINSLOO, G. L. & ROSEN, D. 1975. A new name for *Microterys fuscipennis* Compere, 1928 (Hymenoptera: Encyrtidae) with notes on the species and on related forms. *J. ent. Soc. Sth. Afr.* **38** (1): 85-88.

ROSEN, D. 1973. *Sceptrophorus* Foerster, 1856 (Insecta, Hymenoptera, Chalcidoidea); proposed suppression under the plenary powers. *Bull. zool. Nom.* **30** (2): 108-111.

THOMSON, C. G. 1876 (1875). Scandinaviens Hymenoptera, bearbitade af, 4e Delen, innehalende slägter *Pteromalus* Svederus. *Lund 8vo.* 1-259.

TRJAPITZIN, V. A. 1969 (1968). Review of the Encyrtidae (Hymenoptera, Encyrtidae) fauna of the Caucasus. *Trudy vses. ent. Obshch.* **52**: 43-125. (Tr. from Russian, 1973).

TRJAPITZIN, V. A. & SUGONJAEV, E. S. 1972. *Microterys eleutherococci* sp. nov. (Hymenoptera: Encyrtidae) a parasite of *Eupulvinaria pulchra* (Homoptera: Coccidae) on *Eleutherococcus* in the Maritime district. *Zool. Zh.* **51** (4): 615-617. (Tr. from Russian, 1973).

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